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**EXPERIMENTAL PULMONARY  
ANTHRAX OF MICE:  
INITIAL BACTERIEMIA OR SEPTICEMIA**

TRANSLATION NO.

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U.S. ARMY BIOLOGICAL LABORATORIES  
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EXPERIMENTAL PULMONARY ANTHRAX OF MICE: INITIAL  
BACTERIEMIA OR SEPTICEMIA

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EXPERIMENTAL PULMONARY ANTHRAX OF MICE: INITIAL  
BACTERIEMIA OR SEPTICEMIA

Following is the translation of a French language scientific paper by H. Velu, P. Soulie and B. Bellocq in Comptes Rendus de la Societe de Biologie, (Reports of the French Society of Biology), Vol. 137, Paris, 1943, pp. 159-60.

During research on the pathogenesis of pulmonary anthrax, we demonstrated (1) that, by exposing mice (having inhaled very low doses of anthrax spores) to the strictly controlled action of chlorine, it was possible to trigger fatal pulmonary anthrax in all the mice so treated whereas all of the controls subjected only to the action of either chlorine or the spores survived. This experimental pulmonary anthrax terminated of course in septicemia.

Septicemia is known as the symptom of generalized infection and does not manifest itself, according to the opinion generally held from Buchner to Besredka, until the final stage of the disease. It has nothing in common with the initial bacteriemia subsequent to the inhalation of spores as investigated by Boquet and Saenz (2).

We attempted to elucidate whether septicemia is actually a later sequel. For this purpose, we selected 3 groups of mice, with 1 group of 5 subjected only to the inhalation of spores and another group of 5 subjected only to the action of chlorine (all survived). The third group of 36 was subjected to the action of chlorine and the inhalation of spores purified from all mycelium by carbolic acid at 4 : 1,000. 5 of the latter were killed immediately to determine the number of spores inhaled (maceration of lung in powdered glass and seeding of Petri dishes with the total macerate) which was 350-450. 5 others were maintained in order to follow the evolution of the disease and these died within 52 to 72 hours. 24 of the remaining 26 were killed at the rate of 2 every 3 hours within 36 hours subsequent to the beginning of the experiment, and 2 after 48 hours.

Each animal was examined directly from pulmonary and splenic matter, by broth and gelose cultures (inoculation with platinum wire previously inserted in the heart, spleen and bone marrow) and a count of the germs contained in the lung.

The following table groups all our findings:

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| Interval<br>Before<br>Autopsy | Smear |        | Broth Culture |        |        |
|-------------------------------|-------|--------|---------------|--------|--------|
|                               | Lung  | Spleen | Blood         | Spleen | Marrow |
| 3                             | -     | -      | -             | -      | -      |
| 6                             | -     | -      | -             | -      | -      |
| 9                             | -     | -      | -             | -      | -      |
| 12                            | -     | -      | +             | +      | -      |
| 15                            | -     | -      | -             | -      | -      |
| 18                            | -     | -      | +             | +      | +      |
| 21                            | +     | -      | +             | +      | +      |
| 24                            | ++    | -      | +             | +      | -      |
| 27                            | +     | -      | +             | +      | +      |
| 30                            | ++    | -      | +             | +      | +      |
| 33                            | ++    | -      | +             | +      | +      |
| 36                            | +++   | +      | +             | +      | +      |
| 46                            | +++   | +++    | +             | +      | +      |

| Gelose Culture |        |        | Germ<br>Count<br>(Lung) |
|----------------|--------|--------|-------------------------|
| Blood          | Spleen | Marrow |                         |
| -              | -      | -      | 400                     |
| -              | -      | -      | 350                     |
| -              | -      | -      | 400                     |
| -              | -      | -      | 4000                    |
| -              | -      | -      | 8000                    |
| -              | -      | -      | 12000                   |
| -              | +      | -      | infinite                |
| -              | -      | +      | infinite                |
| ++             | ++     | -      | "                       |
| +++            | +++    | +++    | "                       |
| +              | +      | -      | "                       |
| +++            | +++    | +++    | "                       |
| +++            | +++    | +++    | "                       |

Summary: We deduce from this that, by reason of the extremely small number of spores inhaled, their rapid multiplication in the lung, and the strict conditions of inoculation, it is no longer possible to speak of bacteremia after 12 hours because the positive cultures indicate an initial septicemia, contrary to the generally held opinion.

#### References

- 1 - Bull. Acad. med., 1941, Vol. 125, p. 159
- 2 - C.R. de la Soc. de biol., 1931, Vol. 107, p. 768.